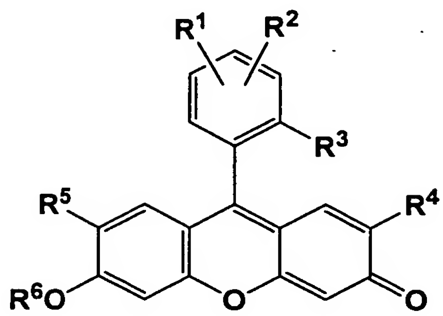
What is claimed is:

1. A fluorescent probe which is represented by the following formula (I):



(I)

(wherein, R^1 and R^2 each independently represents hydrogen atom, or a substituent for trapping proton, a metal ion, or an active oxygen species, provided that both of R^1 and R^2 do not simultaneously represent hydrogen atoms, or R^1 and R^2 may combine to each other to form a ring structure for trapping proton, a metal ion, or active oxygen species; R^3 represents a monovalent substituent other than hydrogen atom, carboxyl group, or sulfonic acid group; R^4 and R^5 each independently represents hydrogen atom or a halogen atom; R^6 represents hydrogen atom, an alkylcarbonyl group, or an alkylcarbonyloxymethyl group, provided that a combination of R^1, R^2, and R^3 provides:
(1) substantially high electron density of the benzene ring to which said groups bind so that the compound represented by the formula (I) is substantially no fluorescent before the trapping of proton, a metal ion, or an active oxygen species, and
(2) substantially reduced electron density of the benzene ring to which said groups bind so that a compound after the trapping, which is derived from the compound represented by the formula (I), is substantially highly fluorescent after the trapping of proton, a metal ion, or an active oxygen species).

2. The fluorescent probe according to claim 1, wherein the oxidation potential of said benzene ring before the trapping of proton, a metal ion, or an active oxygen species is less than 1.40 V, and oxidation potential of said benzene ring after trapping of proton, a metal ion, or an active oxygen species is 1.40 V or higher, and said oxidation potential of said benzene ring increases by 0.20 V or higher after the trapping, under a sufficiently basic condition so that the hydroxy group of the xanthene ring can become a complete anion when R^6 is hydrogen atom.

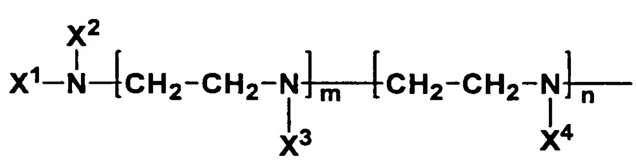
3. The fluorescent probe according to claim 1 or 2, wherein the oxidation potential of said benzene ring before the trapping of proton, a metal ion, or an active oxygen species is less than 1.70 V, and the oxidation potential of said benzene ring after the trapping of proton, a metal ion, or an active oxygen species is 1.70 V or higher, and the oxidation potential of said benzene ring increases by 0.20 V or higher after the trapping, under a sufficiently acidic condition so that the hydroxy group of the xanthene ring can exist in a non-dissociation state when R^6 is hydrogen atom.

4. The fluorescent probe according to any one of claims 1 to 3, wherein R^3 is a lower alkyl group or a lower alkoxy group.

5. The fluorescent probe according to any one of claims 1 to 4, wherein the metal ion is an alkali metal ion, calcium ion, magnesium ion, or zinc ion.

6. The fluorescent probe according to any one of claims 1 to 4, wherein the active oxygen species is selected from the group consisting of nitrogen monoxide, hydroxy radical, singlet oxygen, and superoxide.

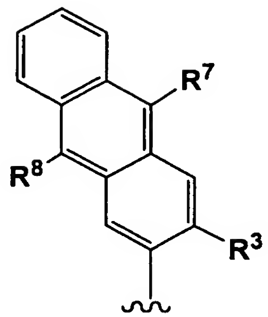
7. The fluorescent probe according to any one of claims 1 to 4, which is for measuring zinc ion or nitrogen monoxide and wherein either or both of R^1 and R^2 are a group represented by the following formula (A):



(A)

(wherein X^1, X^2, X^3, and X^4 each independently represents hydrogen atom, an alkyl group, 2-pyridylmethyl group, or a protective group of amino group, and m and n each independently represents 0 or 1).

8. The fluorescent probe according to any one of claims 1 to 4, which is for measuring singlet oxygen and wherein R^1 and R^2 combine to each other to represent a ring structure represented by the following formula (B):



(B)

(wherein R^7 and R^8 each independently represents a C_{1-4} alkyl group or an aryl group).

9. A method for designing a fluorescent probe which is represented by the aforementioned general formula (I) (wherein, R^1 and R^2 each independently represents hydrogen atom, or a substituent for trapping proton, a metal ion, or an active oxygen species, provided that both of R^1 and R^2 do not simultaneously represent hydrogen atoms, or R^1 and R^2 may combine to each other to form a ring structure for trapping proton, a metal ion, or an active oxygen species; R^3 represents a monovalent substituent other than hydrogen atom, carboxyl group, or sulfonic acid group; R^4 and R^5 each independently represents hydrogen atom or a halogen atom; R^6 represents hydrogen atom, an alkylcarbonyl group, or an alkylcarbonyloxymethyl group), which comprises a step of selecting, as a combination of R^1, R^2, and R^3, the combination which provides:

(1) substantially high electron density of the benzene ring to which said groups bind so that the compound represented by the formula (I) is substantially no fluorescent before the trapping of proton, a metal ion, or an active oxygen species, and

(2) substantial reduced electron density of the benzene ring to which said groups bind so that a compound after the trapping, which is derived from the compound represented by the formula (I), is substantially highly fluorescent after the trapping of proton, a metal ion, or an active oxygen species.

10. A fluorescent probe obtained from the method according to claim 9.